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### FIELD DEPENDENCE COGNITIVE AND LEARNER APTITUDES: EXPERIMENTAL STUDY ON ACCOUNTING STUDENT PERFORMANCE

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#### **ABSTRACT**

This study aims to examine the influence of field independent (FI) and field dependent (FD) cognitive styles and learner aptitudes on accounting student performance. This matter to see whether individuals with higher cognitive skills (FI) have better performance when faced with structured, unstructured, familiar and unfamiliar problem solving. To test the hypothesis, an experimental design was carried out with accounting students as respondents. The results show that the performance of independent field students is higher than dependent fields when answering unfamiliar types of questions. While the performance of the two cognitive styles is no different when faced with familiar types of questions. For structured question types, student performance in independent fields is better than in dependent fields. However, it is no different for the type of unstructured questions.

#### **Introduction**

Some reasons why some students are better at certain types of exam questions have long been an interesting topic for education. Theories used to explain why some students will perform better on the types of questions that are "direct" rather than "indirect", "structured" compared to "unstructured" or "familiar" compared to "foreign". In this study, researchers are interested in investigating how student performance when confronted with different types of questions not only at the level of structure but also in the context of familiarity. At the structural level, what is meant is the degree to which the requirements for the assignment are spelled out in questions (where unstructured questions will require students to identify problems and steps that needed for solutions). According to the context of familiarity, what is meant is whether students tend to recognize certain accounting situations or not, where students have been given the skills needed to solve problems that have been taught before. This study attempts to test whether a student's cognitive style influences their performance on an exam that includes these

types of questions.

Cognitive style is the preferred way for individuals to accept and process information, which in turn affects the way they conceptualize, store and retrieve information [1]. Some results of the previous studies indicate that cognitive style affects the auditor's decision and ability to detect corruption ([2]; [3]; [4]; [5], [6]). Cognitive style affects accounting decisions ([7]; [8]; [9]; [10]; [11], [12]). Cognitive style affects the performance of accountants and auditors ([13]; [14]; [15]; [16]; [17], [18]).

Preliminary studies linking cognitive problems with accounting student performance can be seen in literature reviews such as [19] who tested student performance on CPA exam questions using an "abstract reasoning" measure developed by [20]. The results show that students who have higher reasoning skills (classified as "formal-operational") perform better than those who have lower reasoning skills (classified as "concrete-operational"). These conditions occur when they are confronted with both questions that require higher reasoning skills and require more concrete skills (lower reasoning). The formal and concrete-operational term is used by [20] to describe the complexity of one's cognitive structure. Concrete-operational individuals are oriented to the reality of a relatively concrete and real world that generally cannot consider abstract concepts that depart from that reality. In addition, his ability to carry out certain types of logical operations such as hypothetical reasoning, propositional logic operations, and reasoning about situations that are contrary to facts, is limited to people with concrete-operational. Those who have reached the highest level, called formal- operational, are able to understand concepts that depart from concrete reality, and reasoning is no longer limited to extrapolation from sensory experience. They are able to think of various possibilities and think of what is observed as a special case of various possibilities [20]. Further studies on cognition use the concept of cognitive complexity. Cognitive complexity is a term put forward by [21] which stated that "all people can be directed along a continuum from concrete to abstract, depend on their ability to distinguish and integrate information" [22]. [23] found that accounting students of all levels of cognitive complexity perform well on high- level "structured" accounting questions, but students with high levels of cognitive complexity significantly perform better on unstructured exam questions.

The study conducted by [24] reexamined the studied by [19] using the same reasoning instrument. However, the study ignored a significant problem, namely the lack of formal questions on the CPA exam (93 percent classified as operational concrete). The results show what is in line with the results of researched by [23] that all students, regardless of their level of reasoning, perform equally well on questions that do not require a high level of reasoning. But for those who have high reasoning abilities, they can perform much better than those who have a level of concrete-operational reasoning when faced with questions that require a higher level of analysis.

[25] also conducted experiments on Canadian students who sat for Uniform Final Examination (UFE) - equivalent to the CPA exam in Canada - using another test instrument namely ACCT1 proposed by [26]. The results confirm the same pattern, namely that candidates with higher levels of

cognitive complexity achieve significantly higher scores on questions that tend to be unstructured than candidates with lower levels of cognitive complexity, but both groups achieve the same values on more structured questions. Based on the background and review of previous studies, the authors are interested in testing the effect of cognitive fields dependent and independent fields and learner aptitudes in accounting students. This is to see whether individuals with higher cognitive skills have better performance when faced with unstructured problem solving and vice versa. In addition, the ability to perform in unfamiliar situations is also a function of cognitive skills.

## **Literature Review and Hypothesis**

### **Cognitive Style**

The notion of individual differences in information processing goes back to classical times and regarding qualitative differences in thought, for example verbal versus visual were discussed by Fechner and Galton in the nineteenth century [27]. The difference in the way information processing is known as cognitive style. Many definitions and definitions are conveyed by researchers in this field. [3] explain that one's cognitive style refers to a person's specific way of obtaining, storing, retrieving and transforming information. Cognitive style is defined as a preferred approach and habits of individuals to organize and represent information [28].

Cognitive style is a characteristic model of observing, remembering and solving problems, reflecting the orderliness of information processing that develops in a pleasing way to the underlying personality tendencies [27]. According to [29], cognitive styles are individual differences in how they see, think, solve problems, learn, and relate to one another. This explains how a person processes and organizes information so as to arrive at an assessment or conclusion based on their observations of the situation.

Cognitive style reflects 'how', not 'how well', we perceive and evaluate information. This emphasizes individual nature rather than cognitive ability, focusing on the 'preferred type' as opposed to 'the more the better' in psychometric measures such as IQ [30]. [29] argues that style is a broad dimension of individual differences that stretches between perceptual and intellectual activity, and suggests four characteristics of cognitive style: (i) focus more on form than on learning content; (ii) encompasses dimensions that can be assessed in a manner non-verbal (i.e. perceptual through tests such as the Witkin test or the embedded figures test); (iii) stable all the time; (iv) bipolar.

Many different frameworks for describing cognitive styles refer to the cognitive dimensions of the researchers themselves, often without paying attention to other similar fields. [27] summarizes some of these cognitive style thinking frameworks. According to [31] reviewed more than twenty cognitive / learning style models, while [32] identified over thirty different descriptions. [33] identified twenty-two dimensions of cognitive style and commented that various dimensions of cognitive style and the development of empirical studies using different measures of cognitive style produce complex and confusing fields of science.

### **Field Dependency Cognitive Style**

[29] distinguish two different cognitive styles, namely fields dependence

consisting of fields independent (FI) and fields dependent (FD). Individuals with a field independent style tend to be analytical, able to determine their own structure of information and have an impersonal orientation. While individuals with a field dependent style understand globally, adhere to the structure as given and have a social orientation. Field dependent individuals have perceptions and information processing that is affected by the context in which they operate. This is the extent to which the organization dominates the perception of each of its parts. Field dependent relies on external perspectives while independent fields rely on internal perspectives. [33] suggest a number of implications of this field dependent- independent dimension, namely: (i) field dependents are more able to express themselves and are sensitive on social; (ii) field independents better in academic achievement although this raises problems regarding the relationship between the field dependent-independent construct and ability, with some debate that it is a measure of ability versus style of measure; (iii) field independents have higher training abilities. From the perspective of human resource (HR) development, a number of studies have suggested that field dependent learners tend to be less successful in computer-based and self-instructional learning environments [34].

Several studies on the ability of auditors to detect fraud show that the auditor's cognitive style affects the ability of auditors to detect fraud ([3], [5], [2]). The study by [2] shows that field independent cognitive style affects auditor's ability to predict fraud that is higher than field dependent style. In contrast to the study by [2], the results of the study by [5] showed that there were no differences in the auditor's ability to predict fraud in both the field independent and dependent cognitive styles. The test by [17] results show that cognitive style significantly interacts with the characteristics of task types. Auditor analytics perform better on analytical task types than on intuitive task types. Auditors intuitive perform better on intuitive task types than on analytical tasks.

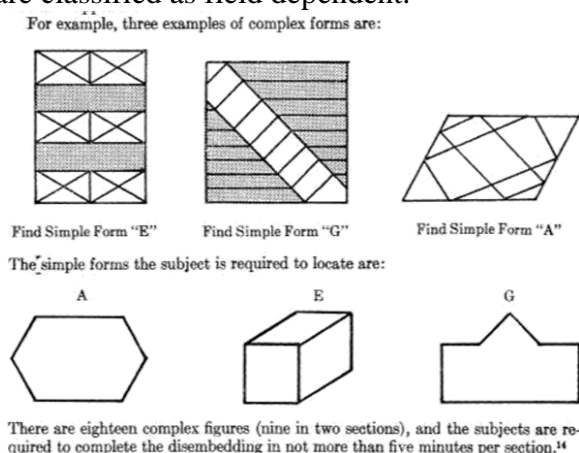
Accounting research that examines the effect of field independent / field dependent (FI/FD) cognitive style on accountants' decisions, the results are not able to show a significant effect (eg, [7], [13]; [8], [14]). In contrast to the results of study by [2] which examining the effect of FI/FD on audit judgment found that the cognitive style significantly affected the auditor's fairness presentation. Subsequent research was conducted by [6] with research similar to study [2] and found that FD/FI had no significant effect on the auditor's fairness presentation. [4] examined the cognitive style of FD / FI on auditor decisions related to the internal audit function. The results are consistent with study by [6] but not consistent with results by [2]. In other words the cognitive style of FD/FI has no significant effect on the auditor's decision results.

The research by [11] examines the combination of cognitive styles and users or non-users of two types of hypertext learning aid and their interactions on student performance in advanced financial accounting. The cognitive style tested was field independent-field dependent (FI/FD). The total number of participants was 107 fourth grade accounting students. One in three students do not use learning aids at all, one does not use the basic version of learning aids (only solutions provided), and one in three uses a development version of learning aids (given solutions and derivatives of these solutions). The

results show that for familiar exam questions, only study aids have a significant effect, and for unfamiliar exams, learning aids, cognitive styles and interactions both have a significant effect. For the two types of questions/exams, performance differs based on cognitive style. These results suggest that educators should be careful in designing and using learning aids.

Study by [12] investigated the effect of cognitive style (field dependence) on performance on different test questions in terms of familiarity and structure level. The cognitive style tested was field independent-field dependent (FI/FD). Participants involved were 160 students in the intermediate financial accounting class. This study found that the performance of students who were field independent was high at solving unfamiliar questions compared to students who were field dependent. There is no significant advantage for students who are field dependent when solving familiar questions. For unstructured questions, the results of this study indicate there is no significant difference between the performance of students who are field dependent and field dependent. While for structured questions, the results of the study showed that the performance of field independent students was better than field dependent students. The results of this study help educators to understand the role of cognitive style on students' ability for familiarity function and as a recommendation for The Accounting Education Change Commission. The results of previous studies indicate that FI and FD cognitive styles affect the performance of auditors in detecting fraud [35] and affect student performance in achieving budget targets [36].

The tool that can be used to measure or test field dependence cognitive is The Group Embedded Figures Test (GEFT) developed by [37]. The GEFT instrument is considered as one of the more established models and is widely researched and continues to be used in the field of accounting [5] and other fields. The GEFT test is a way to find simple figures in more complex figures that are designed in such a way by inserting or hiding simple figures. The ability to find simple figures in complex figures reflects the ability to solve cognitive problems by isolating critical elements and using them in different contexts [11]). Individuals who are able to ignore complex environments and are then able to "see" simple figures in them are classified as field independent while those who have difficulty in finding simple figures are classified as field dependent.



**Figure 1.: The Group Embedded Figure Test (Field Dependence)**

## Learning Aptitudes

Many research has focused on student talent in an effort to understand how individuals approach problem solving. This is an important topic for research in the field of education. Professional bodies and government agencies around the world have expressed concern that students must be increasingly able to tolerate at a high level of ambiguity, and be able to play a role in an environment that is less purposeful and less structured [12]. For example, in 1989, the accounting firm "Big 8" argued that accountants were no longer properly trained to meet the challenges of advancing technology, mushrooming regulations, globalization of trade and complex business transactions [38].

The call for change by large companies for accounting graduates is to focus a lot of attention on the problem of how individuals understand and solve problems [12]. The study by [39] proposes that management accountants must be able to analyze and use intuition and be creative in using their cognitive skills when solving problems. In the UK, the [40] establishes a number of skills that students must possess, one of which is cognitive skills, such as an understanding of methodology or ability in critical analysis. In addition, [41] cautioned educators that the curriculum must also be taught in ways that emphasize conceptual understanding not only through technical means.

Many educators and professional accounting bodies have long debated the use of "unstructured" material in accounting courses. [42] strongly advocates this approach, after writing a number of textbooks on the use of relatively unstructured case materials. The Canadian Chartered Accountant Institute (CICA, 1988) notes that there is a pretty interesting failure that the smartest and best individuals will have the thinking skills needed beyond traditional structured problem solving. In addition, Strategic Proposal #6 calls for the expansion of higher education entry requirements with advanced degrees to emphasize the development of thinking skills, interpersonal skills, and communication skills.

In the United States, the Accounting Education Changes Commission (AECC) pointed out in Position Statement Number One (1990) that accounting graduates must possess the communication, intellectual and interpersonal skills that are important for professional accountants. Intellectual skills include the ability to "find, obtain, and organize information" and the ability to "identify and solve problems" that are not structured in unknown settings and to make judgments based on an understanding of a series of facts that are not focused (AECC, 1990). This ability is very important for accountants and auditors if they want to be able to work with complex and unstructured problems, and to meet the challenges identified earlier by the "Big 8" accounting firm [38].

## Research Development

Based on an understanding of the concepts of fields independent and field dependent cognitive styles as well as learner aptitudes and reviewing previous research, it can be concluded that cognitive style is a factor affecting student performance in answering exam questions. The first hypothesis is built on the general concept of field dependency that

individuals with field independent cognitive styles have higher performance than individuals with field dependent cognitive styles. This first hypothesis is built without considering the types of questions at both the level of structure and familiarity. The first hypothesis builds on the studies of [6], [43], and [11], whose research results strongly support the hypothesis that FI students will generally outperform FD students - in other words, the level of achievement for FI students is more high. Thus first hypothesis (H1) is stated as follows:

H1 : Students with a Field Independent (FI) have higher performance than Field Dependent (FD) cognitive style when confronted with all types of questions regardless of the level of structure or familiarity.

The next hypothesis examines student performance related to the level of familiarity of students on the exam questions. An unknown question is a question in which the context of the question has not been seen before, even though the individual has been taught the way needed to analyze it. On questions that are already familiar or familiar, individuals will have less difficulty in applying the correct analytical tools. This refers to the results of the studies of [11], [44], and [45] in [37]), which shows that the cognitive style of field independent (FI) has a far better performance than the field dependent (FD) when confronted with problems that require isolation of critical elements in a different context from those that have been presented. Thus it can be concluded that students with field independent cognitive style (FI) have better performance on unfamiliar questions than foreign students with field dependent cognitive style (FD).

However, when faced with familiar question types, students with field independent cognitive style (FI) do not have special advantages compared to students with field dependent cognitive style (FD). This is because with familiar questions, the context has been equally well understood by individuals with field independent cognitive style (FI) and field dependent cognitive style (FD). As a result, FI's superior ability to isolate important elements in different contexts no longer applies [45]. Thus hypothesis 2 and hypothesis 3 are stated as follows:

*H2 : Students with Field Independent (FI) have higher performance than Field Dependent (FD) cognitive style when faced with unfamiliar types of questions.*

*H3 : There is no difference in performance between students with the Field Independent (FI) and Field Dependent (FD) cognitive styles when faced with familiar types of questions.*

The next hypothesis examines the role of students' cognitive styles on the types of questions with their level of structure in the exam. Unstructured questions tend to be presented unfocused: usually students are needed to identify problems and rank, and are forced to make assumptions. As a result, more than one solution is generally available with questions of this type, and there is a high degree of ambiguity in them. However, the availability of literature related to field dependencies does not provide much clear evidence

of differences in student performance with the cognitive style of FI and FD when confronted with questions that present varying degrees of structure. However, the study by [12] show that when confronted with structured questions, individuals with field independent (FI) cognitive style have higher performance than field dependent (FD) . Thus hypothesis 4 and hypothesis 5 are stated as follows:

*H4 : There is no difference in performance between students with the Field Independent (FI) and Field Dependent (FD) cognitive styles when faced with unstructured types of questions.*

*H5 : Students with Field Independent (FI) have higher performance than Field Dependent cognitive style (FD) when faced with structured question types.*

### **Method**

The subjects in this study were students of the Department of Accounting at a college in Palembang. Demographic variables that were asked were age, gender, courses taken, and GPA. Students are chosen as a proxy that can represent the performance of accountants in solving accounting problems. The data collection was carried out in an experimental laboratory that had been conditioned for conducting the experiment.

This study uses an experimental design to investigate hypotheses. The design of the experiment uses two steps of testing. The first step taken by participants is to test the cognitive style of participant field dependent / independent. The tool used was The Group Embedded Figures Test (GEFT) developed by [37]. The second step is that participants are given four types of questions (structured, unstructured, familiar and unfamiliar) in the test.

Hypothesis testing is carried out to test student performance on four types of questions, namely familiar, unfamiliar, structured and unstructured. Each question has two characteristics: the level of familiarity and the level of structure. This results in four combinations of questions: familiar / structured; familiar / unstructured; not familiar / structured and not familiar / not structured. To test H2 only one question that is not familiar from the four combinations of questions is needed. To get these unfamiliar questions, it is necessary to combine unfamiliar / structured questions and unfamiliar / unstructured questions by calculating the weighted average of answers. To test H3-H5, this process is repeated to derive familiar questions (using a weighted average of familiar/structured and familiar/unstructured questions), structured questions (using a weighted average of familiar/structured and unfamiliar/structured questions) , while for unstructured questions (using a weighted average of familiar/unstructured and unfamiliar/unstructured questions). To test H1, on average all four types of questions are used. This study uses descriptive statistical analysis and independent sample t-test to test the research hypotheses.

### **Result**

In this study, data obtained through the experimental method were used by participants in Accounting major who were proxied as production managers.



All participants who took part in the experimental session totaled 160 people. In this experiment the researcher guides the participants in working on the stages of the experimental task so that the time spent can be efficient. The time needed to work on the entire set of instruments is 120 minutes. Table 1 shows the amount of data / instruments that can be processed in the study.

**Table 1.**

**Data Collection Results**

Cell		N	Mean	
<i>Field Independent</i> (N= 94)	Theoretical Range: (9 - 18)	Structured	22	76,95
		Unstructured	25	70,28
		Familiar	20	80,65
		Unfamiliar	27	74,44
<i>Field Dependent</i> (N= 66)	Theoretical Range: (1- 9)	Structured	18	64,28
		Unstructured	15	71,33
		Familiar	20	77,65
		Unfamiliar	13	63,85

Table 1 shows that from the initial number of participants gathered 160 people. After testing the GEFT Field independent and field dependent cognitive style, 94 people were obtained with independent field cognitive styles and 66 people with field dependent cognitive styles. The theoretical range score for the FI cognitive style is 9-18 and the FD cognitive style is 1-9. This is measured based on GEFT which measures cognitive style with 18 questions testing the ability to determine the right picture. Each cognitive style is asked to complete tasks related to four types of questions, namely structured (40 people), unstructured (40 people), familiar (40 people) and unfamiliar (40 people).

Student performance with FI cognitive style and structured question types was 76.95 (22 people). Student performance with FD cognitive style and structured question types was 64.28 (18 people). Student performance with FI cognitive style and type of unstructured questions was 70.28 (25 people). Student performance with FD cognitive style and types of unstructured questions was 71.33 (15 people). Student performance with FI cognitive style and familiar question types was 80.65 (20 people). Student performance with FD cognitive style and familiar question types was 77.65 (20 people). Student performance with FI cognitive style and unfamiliar question types was 74.44 (27 people). Student performance with FD cognitive style and unfamiliar question types was 63.85 (13 people). The results of normality test data on student performance in completing or answering questions on four types of questions are normal. Student performance with independent field cognitive style showed a significance value of more than 0.05 (structured 0.119, unstructured 0.199, familiar 0.431 and unfamiliar 0.322). The performance of students with field dependent cognitive style showed a significance value of more than 0.05 (structured 0.635, unstructured 0.392, familiar 0.308 and unfamiliar 0.216). Thus it can be concluded that the student performance variable data in answering normal distributed questions.

### Hypothesis Results

First hypothesis (H1) states that students with Field Independent (FI) style have higher performance than students with Field Dependent (FD) cognitive style when confronted with all types of questions regardless of structure level or familiarity. To test the hypothesis one (H1) it is used Independent Sample T\_Test different test analysis tools with the help of SPSS (Statistical Package for Social Sciences) software. The test results can be seen in table 2.

**Table 2: Result of First Hypothesis (H1) Test Student Performance (Four Types of Questions) Based on Cognitive Style Difference**

Cognitive Style	Descriptive			Hypothesis			
	N	Mean	Std. Dev	Levene Test		Equal Variance Assumed	
				F	Sig	T	Sig
Field Independent	94	75,24	13,055	0,449	0,504	2,493	0,014
Field Dependent	66	69,85	14,058				

Significance at level 0,05

Source: Output SPSS from Processed Data 2019

Table 2 shows that based on descriptive statistical data, participants with field independent cognitive styles numbered 94 people and had an average performance of 75.24 with a standard deviation of 13.055. For participants with a field dependent cognitive style amounted to 66 people and have an average performance of 69.85 with a standard deviation of 14.058. The t-test different test results showed that the value of t at the equal variance assumed was 2.493 with a significance probability of 0.014. Thus it can be concluded that the average of student performance in completing assignments differs significantly based on the field independent and dependent cognitive styles for the four types of questions as a whole. Based on the results of these tests, it can be concluded that hypothesis one (H1) is statistically supported.

Second hypothesis (H2) states that students with a Field Independent (FI) cognitive style have higher performance than students with a Field Dependent cognitive style (FD) when confronted with unfamiliar types of questions. The test results can be seen in table 3.

**Table 3: Result of Hypothesis 2 (H2) Test Student Performance (Unfamiliar Question) Based on Cognitive Style Difference**

Cognitive Style	Descriptive			Hypothesis			
	N	Mean	Std. Dev	Levene Test		Equal Variance Assumed	
				F	Sig	T	Sig
Field Independent	27	74,44	13,751	1,231	0,274	2,326	0,025
Field Dependent	13	63,85	12,935				

Significance at level 0,05

Source: Output SPSS from Processed Data 2019

From table 3 it can be seen that the F calculated levene test is 1.231 with a probability of 0.247. Because the probability is more than 0.05, it can be concluded that both groups have the same variance. Thus the t-test different test analysis uses the assumption of equal variance assumed. The t-test different test results showed that the value of t at the equal variance assumed was 2.326 with a significance probability of 0.025. Probability values below 0.05 indicate a significant difference in mean between the two test groups. Thus it can be concluded that the average student performance in completing assignments differs significantly based on independent and dependent field cognitive styles for unfamiliar questions. Based on the results of these tests, it can be concluded that hypothesis two (H2) is statistically supported. Third hypothesis (H3) states that there is no difference in performance between students with the cognitive style of Field Independent (FI) and Field Dependent (FD) when faced with familiar types of questions. The test results can be seen in table 4.

**Table 4**  
**Result of Hypothesis 3 (H3) Test Student Performance (Familiar Question) Based on Cognitive Style Difference**

Cognitive Style	Descriptive			Hypothesis			
	N	Mean	Std. Dev	Levene Test		Equal Variance Assumed	
				F	Sig	T	Sig
Field Independent	20	80,65	10,835	0,816	0,668	0,835	0,409
Field Dependent	20	77,65	11,873				

Significance at level 0,05

Source: Output SPSS from Processed Data 2019

Table 4 shows that based on descriptive statistical data, participants with field independent cognitive styles numbered 20 people and had an average performance of 80.65 with a standard deviation of 0.835. For participants with a field dependent cognitive style numbered 20 people and have an average performance of 77.65 with a standard deviation of 11.873. Levene test of 0.816 with a probability of 0.668 shows that both groups have the same variance. The t-test results showed that the value of t at the equal variance assumed was 0.835 with a significance probability of 0.409. Probability values above 0.05 indicate no significant difference in mean between the two test groups. Thus it can be concluded that the average student performance in completing assignments did not differ significantly based on field independent and field dependent cognitive styles for familiar questions.

Forth hypothesis (H4) states that there is no difference in performance between students with the cognitive style of Field Independent (FI) and Field Dependent (FD) when faced with unstructured types of questions. The

test results can be seen in table 5.

**Table 5: Result of Hypothesis 4 (H4) Test Student Performance (Unstructured Question) Based on Cognitive Style Difference**

Cognitive Style	Descriptive			Hypothesis			
	N	Mean	Std. Dev	Levene Test		Equal Variance Assumed	
				F	Sig	T	Sig
<i>Field Independent</i>	25	70,28	13,381	0,112	0,740	-0,233	0,817
<i>Field Dependent</i>	15	71,33	14,573				

Significance at level 0,05

Source: Output SPSS from Processed Data 2019

Table 5 shows that based on descriptive statistical data, participants with field independent cognitive styles numbered 25 people and had an average performance of 70.28 with a standard deviation of 13.381. For participants with cognitive style of field dependent amounted to 15 people and have an average performance of 71.33 with a standard deviation of 14.573. The F value for the levene test is 0.112 with a probability of 0.740 indicating that both groups have the same variance. The results of the t-test showed that the value of t at the equal variance assumed was -0.233 with a significance probability of 0.817. Thus it can be concluded that the average student performance in completing assignments is not significantly different. Thus it can be concluded that hypothesis four (H4) is statistically supported.

Fifth hypothesis (H5) states that students with a Field Independent (FI) cognitive style have higher performance than students with a Field Dependent (FD) cognitive style when faced with structured question types. The test results can be seen in table 6.

**Table 6: Result of Hypothesis 5 (H5) Test Student Performance (Structured Question) Based on Cognitive Style Difference**

Cognitive Style	Descriptive			Hypothesis			
	N	Mean	Std. Dev	Levene Test		Equal Variance Assumed	
				F	Sig	T	Sig
<i>Field Independent</i>	22	76,95	12,195	0,388	0,537	3,166	0,003
<i>Field Dependent</i>	18	64,28	13,083				

Significance at level 0,05

Source: Output SPSS from Processed Data 2019

Table 6 shows that based on descriptive statistical data, participants with field independent cognitive styles numbered 22 people and had an average performance of 76.95 with a standard deviation of 2.195. For participants with cognitive style of field dependent numbered 18 people and have an average performance of 64.28 with a standard deviation of 13.083. The F value for the levene test is 0.388 with a probability of 0.537 indicating that both groups have the same variance. The t-test results showed that the value

of  $t$  at the equal variance assumed was 3.166 with a significance probability of 0.003. Thus it can be concluded that the average student performance in completing assignments differs significantly based on the field independent and field dependent cognitive styles for structured questions. Based on the results of these tests, it can be concluded that hypothesis five (H5) is statistically supported.

### **Discussion**

This study provides additional literature by directly investigating the relationship between students' cognitive styles and their ability to solve different types of questions in the context of familiarity and structure level. As predicted by theory, overall (without differentiating the types of questions), students with field independent (FI) cognitive style exhibit a higher ability than field dependent (FD) in answering questions.

In testing specific types of questions, this study shows that students with field independent cognitive styles have significantly different performance than field dependent students for unfamiliar types of questions. As for the types of familiar questions, the results show there is no difference between field independent and field dependent cognitive styles. This of course contradicts theoretically. Therefore, the field independent cognitive style is not showing strength when faced with a type of task that is very recognizable / familiar, but provides many advantages when faced with a type of task that is not very recognized. Thus higher education should emphasize lecturers and educators to prepare students to deal with unfamiliar types of questions. This study provides some important input in understanding the characteristics of students as desired.

This study was not able to predict in advance how a student's cognitive style can affect performance in resolving structured and unstructured questions. This study observes that the literature is not conclusive which allows other factors to be more influential than cognitive styles in task completion. The results of the study regarding unstructured questions are consistent with the inconclusive literature review. The results of the study that are beyond prediction are on the types of structured questions, which are predicted that there is no difference between FI and FD. In the context of structured questions, the results of the study indicate that the performance of FI students is higher than that of FD. This is likely to occur because structured questions tend to have a large and integrated amount of information that is not beneficial for students with a cognitive style. Furthermore, there is the possibility of structured questions both familiar and unfamiliar types provide challenges that are not different for both FI and FD. Thus without considering both the types of questions that are familiar and unfamiliar, for the types of structured questions, the results of this study indicate that FI students have higher performance compared to FD.

The results of this study have implications for educators in colleges. The results of the study showed that students with field independent cognitive style had better performance in solving unfamiliar types of questions. However, this does not mean that students with a field dependent cognitive style do not have the possibility of good performance. Thus, additional skills of knowledge, communication, intellectual skills, and interpersonal skills are needed to become successful professionals. Students with field dependent cognitive styles tend to have higher interpersonal skills than

independent fields [29]. Ideally, students with identified field independent and field dependent cognitive styles can be given appropriate instruction according to their learning style. Such actions, however, are often economically incompatible with the financial conditions of most colleges. However, instructors should be aware that accounting students exhibit different learning styles, and therefore each must have the opportunity to answer exam questions that fit their particular talents.

There are limitations to this study as with almost all experimental studies. This research is only conducted at one colleges which may not obtain the same results. Furthermore, studies depend on accurate categorization of questions into four types - familiar, unfamiliar, structured and unstructured. It may be that there are several other factors that affect performance on questions that are not tested from research. Future studies may be able to use different question classification schemes that might produce different results. Future research can explore structured exam questions and, especially, unstructured and what drives different results for students with field dependent cognitive styles. Future researchers can also use other cognitive style measures such as Cognitive Styles Analysis [32] or ACCT [26]. This can be used to determine whether the type of cognitive style affects performance on this type of examination question. In addition, further research can use another classification scheme of exam questions that must be completed by accounting students.

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